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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,835	12/10/2001	Ronaldus Maria Aarts	NL 000696	3542

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EXAMINER

GRAHAM, ANDREW R

ART UNIT PAPER NUMBER

2644

DATE MAILED: 10/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/015,835

Applicant(s)

AARTS ET AL.

Examiner

Andrew Graham

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Specification

1. The specification is objected to for failing to meet the requirements of 37 CFR 1.77(c).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claim 6** is rejected under 35 U.S.C. 102(b) as being anticipated by Heyl et al (USPN 5613010), hereafter "Heyl".

Heyl teaches an apparatus for reducing the dynamic range of an input audio signal.

Specifically regarding **Claim 6**, Heyl teaches:

An audio reproducing device (speaker system 600, Figure 6) comprising:

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an input for receiving a k-channel input signal (connection from 602 to 604; col. 12, lines 6-14; inputs may be stereophonic, col. 6, lines 7-12),

an audio processing unit (comprising at least components 604, 606) for processing the input signal (col. 12, lines 12-40), and

an output for supplying an l-channel output signal to l loudspeakers (connection of the at least one signal from driver 606 to speaker load 608, col. 12, lines 39-40, wherein l is at least equal to 1),

wherein the audio processing unit comprises enhancing means (604) with a $\tanh(x)$ transfer function (604 is a mapping unit, system of 600 implements circuit 550, col. 12, lines 1-4; circuit 550 implements a smooth saturation function, which may include a \tanh function, col. 10, lines 34-46; col. 11, lines 7-20)

3. Claims 7-8 and 13-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Vaudrey et al (USPN 6442278 B1), hereafter "Vaudrey".

Vaudry discloses a system for processing and downmixing the various channels of a multichannel input signal.

Regarding Claim 7, Vaudrey teaches:

An audio reproducing device (Figures 2, 5, 7, 8) comprising:

an input for receiving a multi-channel input audio signal (input to decoder 9, col. 7, lines 4-11),

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a splitter (encoder 262, Figure 7, col. 9, lines 4-32; or, alternatively, decoder 271 or 281, Figures 8-9, col. 9, lines 45-56) for splitting (decoding) the multi-channel input audio signal into n output signal parts (above citations and figures, as well as col. 7, lines 10-14)

an enhancer (comprising components such as 264, 266, 267 in Figure 7, or alternatively units 276a-f of Figure 8) for enhancing (adjusting respective gain) of m channel signal parts (wherein m is three parts, Figure 7 or alternatively, all parts, Figure 8),

a combiner for combining m enhanced signal parts from the enhancer and n-m signal parts from the splitter (comprising 268, 269 of Figure 7 wherein n-m=2, or alternatively, comprising one of units 272-275, wherein n-m=0), and

an output for supplying an l-channel output signal to l loudspeakers (connection of L,R output signals of 268-269 in Figure 7, or alternatively outputs of blocks 272-275 in Figure 8, to reproduction speakers, as is generally shown in Figures 5 and 6; col. 8, lines 54-57 and 66-67; col. 9, lines 1-3 and 40-44).

Regarding **Claim 8**, Vaudrey discloses:

wherein the enhancer has a monotone transfer function (gain applied to channels is constant, such as -3 db in Figure 7, which is indicative of linear gain function $\{y = x + \text{constant}\}$ across various levels of input signal, and thus monotonic, col. 9, lines 15-64).

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Regarding **Claim 13**, Vaudrey discloses:

a pre-processing unit (7) for the multi-channel input signal
(col. 7, lines 4-9)

Regarding **Claim 14**, please refer above to the functions performed by the decoder, gain, adder, and output connection components cited above and relied upon in the rejection of the similar limitations of Claim 7.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 9-12 and 15-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaudrey as applied above, and in further view of Heyl.

As detailed above, Vaudry discloses a system for processing and downmixing the various channels of a multichannel input signal.

Pertaining the signal processing performed in the various embodiments disclosed by Vaudrey, the teachings of Vaudrey does not clearly specify:

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the enhancer comprises a non-linear device with a monotone transfer function Heyl teaches an apparatus for reducing the dynamic range of an input audio signal.

Specifically regarding **Claim 9**, Heyl teaches:

the enhancer (circuit 550 of Heyl in view of audio signal gain processing of Vaudrey, as cited above) comprises a non-linear device (analog circuit implementing smooth saturation function, col. 11, lines 27-31)with a monotone transfer function (tanh function, which is one possible function noted by Heyl, col. 11, lines 1-20).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the smooth saturation function processing as disclosed by Heyl as part gain-related signal processing of one or more component audio channels (L,R,C,Ls,Rs,LFE) in the system of Vaudrey. The motivation behind such a modification would have been that such dynamic range control would have enabled the sound information present in the one or more component audio channels to be enhanced in terms of intelligibility, as is taught by Heyl.

Regarding Claims 10-12 and 15-16, the smoothing saturation functions suggested by Heyl include a tanh function, which is "anti-symmetrical" as claimed in Claim 10, is a "tanh(x) transfer function" as claimed in Claims 11 and 16, and has "a monotone decreasing slope" as claimed in Claims 12 and 15 (col. 11, lines 15-20).

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 571-272-7517. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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October 3, 2005


XU MEI
PRIMARY EXAMINER